

ABSTRACT

A method for rapid, fully automatic, two-dimensional (2-D) and three-dimensional (3-D) tracing of line-structure images, such as images of neurons produced by fluorescence confocal microscopy. A method of 5 recursively following the line-structure topology, guided by the correlation response of a set of $4 \times N^2$ directional kernels in the 3-D case, and a set of $2 \times N$ directional kernels in the 2-D case, is presented. These kernels are derived based on a generalized cylinder model of the line-structures. The automatic tracing method includes a protocol for determining the ends of line- 10 structures.

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